

Serial No. 10/723,271  
Filed: November 26, 2003  
Amendment and Response to Office Action

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## REMARKS

### I. PENDING CLAIMS AND SUPPORT FOR AMENDMENTS

Upon entry of this Amendment, claims 1-7 and 9-21 will be pending in this application. Applicant has amended claim 1 to incorporate the limitations of claim 8, and has rewritten original claims 15 and 19 in independent form. No new matter has been added.

### II. OBVIOUSNESS REJECTIONS

#### A. Hiller in view of Nohren et al.

At page 2 of the Office action, the Examiner has rejected claims 1-3, 5, 7-13, and 16-19 under 35 U.S.C. § 103(a) as obvious over Hiller (U.S. Patent No. 3,950,251) in view of Nohren et al. (U.S. Patent No. 5,609,759). Applicant respectfully traverses this rejection and requests its reconsideration and withdrawal.

Hiller teaches that the activated charcoal granules used in the disclosed filter should be 14 x 40 mesh granules. This corresponds to particles that will pass through a 1435  $\mu\text{m}$  sieve (i.e., a 1.435 mm sieve), but will not pass through a 420  $\mu\text{m}$  sieve. In other words, the particle sizes range between about 1.4 mm and about 0.42 mm. These particles are considerably larger than those recited in Applicant's claims, which range from 50 mesh (297  $\mu\text{m}$ ) to 375 mesh (39.3  $\mu\text{m}$ ). The Examiner appears to recognize this defect in Hiller. In an attempt to cure it, the Examiner appears to take the position that it would have been obvious to one of ordinary skill in the art to replace the granules of Hiller with powdered material disclosed in Nohren et al. Apparently, the Examiner is of the view that this powdered material would have a particle size within the range recited in Applicant's claims.

Serial No. 10/723,271  
Filed: November 26, 2003  
Amendment and Response to Office Action

However, any disclosure in Nohren et al. relating to particle size has nothing to do with the use of powdered purification media, contrary to what the Examiner appears to suggest. Nohren et al. state:

One preferred composition of filtering material is activated carbon, typically with a binder. For example the filtering material may comprise about 95-30%, about 80-325 mesh, activated carbon powder or granules. The binder may comprise 5-60%, about 75-135 mesh, plastic resin granules.

Nohren et al., column 2, lines 20-25. Indeed, the portion of Nohren et al. specifically cited in the Office action states:

While the filtering material may comprise a wide variety of materials, in the preferred embodiment illustrated in FIG. 1 the filtering material of the tube 25 comprises activated carbon which may be extruded or die molded in combination with plastic resin. For example the tube 25 may have a porosity of 10-120 microns and be produced using about 5-60% binder (such as about 75-135 mesh plastic resin granules) and about 95-30% powdered or granular activated carbon of about 80-325 mesh.

Nohren et al., column 4, lines 10-18. It seems clear that Nohren et al. disclose using a powdered carbon material in a carbon block, not as a powdered purification media per se, as recited in Applicant's claims.<sup>1</sup> The Examiner has therefore asserted, in effect, that it would have been obvious to use particles of a size found in a carbon block in an unbound, particulate filtration material instead. There are a number of reasons why this is incorrect.

First of all, the interaction of a flowing fluid (e.g., water) with unbound particles is completely different from the interaction between a fluid and a carbon block. In a carbon

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<sup>1</sup> Before the Examiner provides the standard rebuttal that "a reference is not limited to its preferred embodiments," Applicant would like to point out that (1) this "preferred embodiment" is the only embodiment disclosed, and the only place in the specification where particle size is even mentioned, and (2) this is the disclosure that the Examiner himself relies upon; it would be manifestly unfair to dismiss Applicant's arguments based on some nebulous notion of "other, undisclosed embodiments" when the Examiner himself relies on the preferred (in fact, the only) embodiment to provide his alleged teaching.

Serial No. 10/723,271

Filed: November 26, 2003

Amendment and Response to Office Action

block, such as that disclosed in Nohren et al. (and as element 34 in Hiller), the carbon particles are immobilized by the binder resin. It is therefore extremely difficult for the particles to be taken up by the flowing liquid and carried to other parts of the filtration system, where they can clog the system, or if small enough, exit the system with the flowing water (carrying along with them whatever contaminants or pathogens that have adhered to them). Thus, one of ordinary skill in this art might be willing to use small particles in a carbon block to increase surface area, and because there is little chance of the particles breaking free of the block and being carried through the filtration system.

Second, one of ordinary skill in the art would know that the use of smaller particles in an unbound filter element can lead to significant channeling, as fluid flow displaces the smaller particles laterally, opening up a less obstructed flow path through the filter element. Because fluid flowing through the channel is in contact with less of the media material, it is not as effectively treated for contaminants. The effectiveness of the filter at removing contaminants can therefore be decreased. The larger particles disclosed by Hiller are more difficult to push aside, and therefore less likely to lead to channeling than would the smaller particles disclosed by Nohren et al. for use in a carbon block (where such channeling does not occur because the particles are bound together in a three-dimensional structure by the binder resin). Again, one of ordinary skill in this art would not have been motivated to substitute the small carbon block particles of Nohren et al. for the large unbound filtration media particles of Hiller.

Instead, one of ordinary skill in the art, reading the disclosures of Hiller and Nohren et al. together, would have been motivated to use the large granule-sized particles disclosed

Serial No. 10/723,271  
Filed: November 26, 2003  
Amendment and Response to Office Action

in Hiller, not the smaller carbon block particles of Nohren et al., in the second filter element 35 of Hiller in the reasonable expectation that these larger particles are less likely to be carried off by the flow of water through the system, less likely to clog the carbon block 34, and less likely to exhibit poor performance due to channeling. This worker might have been motivated to use the smaller particles of Nohren et al. in the carbon block of Hiller, but that would not result in the invention of claim 1.

The Examiner appears to recognize that neither Hiller nor Nohren et al. teach or suggest the micron rating of the porous purification block recited in original claim 15, now rewritten as new claim 20. Applicant agrees that this claim is not rendered obvious by these two references, either alone or combined together.

However, the Examiner does appear to consider that the combined reference teachings renders obvious original claim 19, now rewritten as new claim 21, since this claim was included in the Examiner's statement of rejection. However, nowhere in his rejection does the Examiner explain how either of these references teaches or suggests a density of particulate filtration media in the range recited in claims 19 and 21. To the contrary, such a density range could not have been obvious to one of ordinary skill in this art, since neither reference even teaches or suggests that the density of particulate filtration media is a result-effective operating parameter. *See In re Antonie*, 195 USPQ 6, 8-9 (CCPA 1977). Applicant respectfully submits that claim 19 (as it depends from currently amended claim 1) and claim 21 (corresponding to originally filed claim 19) are separately patentable over the combined teachings of Hiller and Nohren et al. because of the failure to teach or suggest the powder density limitations recited therein.

Serial No. 10/723,271  
Filed: November 26, 2003  
Amendment and Response to Office Action

For at least the reasons given above, Applicant respectfully submits that the Examiner has failed to establish a prima facie case of obviousness, and that as a result, the rejection should be withdrawn.

B. Hiller, Nohren et al., and Carrubba et al.

At page 3 of the Office action, the Examiner has rejected claim 4 under 35 U.S.C. § 103(a) as obvious over Hiller and Nohren et al., and further in view of Carrubba et al. (U.S. Patent No. 5,338,458). Applicant respectfully traverses this rejection and requests its reconsideration and withdrawal.

Applicant does not dispute that the catalytic chars disclosed in Carrubba et al. can decompose chloramine. However, Carrubba et al. does not cure the deficiencies of Hiller and Nohren et al. described above in that Carrubba et al. does not provide a teaching or suggestion that particulate filtration media having the size range recited in claim 1 should be combined with a carbon block. As with Nohren et al., the particles disclosed in Carrubba et al. are much smaller than those used by Hiller, and one of ordinary skill in this art would not have been motivated to substitute the smaller Carrubba et al. particles for the larger Hiller particles in anticipation of the problems described above. Moreover, even if such a combination of teachings were to be made, the result would not be a particle size distribution having the endpoints recited in claim 1. In either event, the Examiner has failed to establish a prima facie case of obviousness, and this rejection should be withdrawn.

C. Hiller, Nohren et al., and Levy

At page 3 of the Office action, the Examiner has rejected claims 6, 14, and 15 under 35 U.S.C. § 103(a) as obvious over Hiller and Nohren et al., further in view of Levy (U.S.

Serial No. 10/723,271  
Filed: November 26, 2003  
Amendment and Response to Office Action

Patent Publication No. 2001/0042719). Applicant respectfully traverses this rejection and requests its reconsideration and withdrawal.

Applicant does not dispute that the block filtration material containing metal oxide nanocrystals disclosed in Levy could be used as the porous purification block of the apparatus claimed in claims 6, 14, or 15. However, nowhere in any of the cited references is such a use suggested. Even if such a use were suggested, combination with the disclosure of Levy would not cure the deficiencies in Hiller and Nohren et al. noted above, since Levy does not disclose using powdered, unbound filtration media. Finally, Applicant is at a loss to understand the rejection of claim 6 over this combination of references. Paragraph [0012] of Levy discloses the use of zirconia as part of the filtration block. Claim 6 of this application recites the presence of zirconia in the powdered purification media; powdered purification media is not taught or suggested in Levy.

For at least the reasons given above, Applicant respectfully submits that the Examiner has failed to establish a prima facie case of obviousness, and as a result, the rejection should be withdrawn.

Applicant respectfully submits that this application is in condition for immediate allowance, and an early notification to that effect is earnestly solicited. If the Examiner believes that a personal or telephonic interview will be useful in advancing prosecution, he is respectfully requested to contact the undersigned before issuance of a final office action, in order to arrange such an interview.

The Commissioner is hereby authorized to charge any deficiencies or credit any overpayment to Deposit Order Account No. 11-0855.

Serial No. 10/723,271  
Filed: November 26, 2003  
Amendment and Response to Office Action

Respectfully submitted,



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